UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/614,592	07/12/2000	Toshifumi Sato	Q60082	2296

7590   01/07/2005

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Washington, DC 20037-3202

EXAMINER
FAN, CHIEH M

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 01/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 June 2004*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,7 and 9* is/are rejected.

7)☒ Claim(s) *2-6,8 and 10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2.   Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Sawahashi et al. (U.S. Patent No. 6,069,912, "Sawahashi" hereinafter) in view of Ono

(U.S. Patent No. 6,272,167).

Sawahashi discloses a path search circuit in a CDMA cellular system,

comprising:

an antenna having a plurality of elements (901A-901C in Fig. 9);

a plurality of radio receivers for frequency-converting radio frequency signals

received respectively by the elements of the antenna into respective baseband signals

(902A in Fig. 9, note that the RF stage includes a plurality of RF elements, see 102A-

102D in Fig. 1 or 502 in Fig. 5);

a plurality of A/D converters for converting the respective baseband signals into

digital data (902A in Fig. 9, note that the RF stage includes a plurality of A/D converters,

see 103A-103D in Fig. 1 or 503 in Fig. 5);

a plurality of correlation processors for calculating cross correlations between the digital data converted from the baseband signals and a signal known at a reception side, and outputting respective correlation signals (903A-903C in Fig. 9);

a weighted-mean-value processor for weighting and adding the correlation signals output from said correlation processors based on indicated weighting coefficients (904A-904C in Fig. 9);

a phase fluctuation estimator for outputting reception timing (phase) of a reception path (906 in Fig. 9); and

a weighting controller for controlling said weighting coefficients to determine a directivity of said antenna and generating a plurality of weighting coefficients to establish a plurality of general antenna directivities for dividing a sector where a mobile terminal with which to communicate is present, when a communication session starts (912 and 913 in Fig. 9).

The embodiment shown in Fig. 9 of Sawahashi does not specially teach (a) an averaging element to average the weighted and added correlation signals, and (b) the phase fluctuation estimator includes a correlation peak detector for detecting at least one peak from the weighted and averaged correlation signals output as delay profiles from said weighted-mean-value processor, and outputting a reception level and reception timing corresponding to the detected peak as a reception level and reception timing of a reception path.

With respect to item (a), Sawahashi also teaches that, in a multipath environment, the weighted and added correlation signals are averaged (508 in Fig. 5)

before the weighted and added correlation signals are combined in a rake combiner

(511 in Fig. 5) in order to improve the signal quality and improve the detection accuracy.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time

the invention was made to average the weighted and added correlation signals in the

embodiment shown in Fig. 9 of Sawahashi in a multipath environment, so as to improve

the signal quality and improve the detection accuracy.

With respect to item (b), it is well known a peak detector is required in the phase

fluctuation estimator because the received phase is determined by the peak levels of

the correlation between the received signal and a known signal, e.g. a pilot signal. Ono

teaches that, in a CDMA system, a delay profile calculation unit calculates a delay

profile from the reception signal (col. 3, lines 30-36). The delay profile is supplied to a

path control unit. The path control unit detects a peak output phase from the delay

profile at which N number of peak levels are obtained with a large correlation power.

The peak output phase is converted to phases, i.e., timing, of a reception channel (col.

3, lines 44-50). Therefore, it would have been obvious to a person of ordinary skill in

the art at the time the invention was made to recognize that a peak detector is required

in the phase fluctuation estimator of Sawahashi to detect the peak levels of correlation,

and thereby to determine the phase (timing) of the reception path.

3.   Claims 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Sawahashi in view of Ono as applied to claim 1 above, and further in view of Dobbins et

al. (U.S. Patent No. 5,730,272).

As applied to claim 1 above, Sawahashi in view of Ono teaches the claimed invention but fails to teach a moving average method (claim 7) or an exponentially weighted mean method (claim 9). However, both moving average and exponentially weighted mean methods are well known methods for calculating average in the art. Dobbins et al. teaches that the exponentially weighted moving average also has the advantage of ease of microprocessor implementation since the exponentially weighted moving average can be easily calculated (col. 15, lines 38-40). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to calculate average using exponentially weighted moving average method, since the exponentially weighted moving average can be easily calculated and be easily implemented in a microprocessor.

Response to Arguments

4.   Applicant's arguments filed 6/21/04 have been fully considered but they are not persuasive.

Beginning on page 9 of the reply (section 2), the applicant argues that the combination of Sawahashi et al. and Ono et al. fails to suggest a weighted-mean-value processor that weights and adds the correlations signals output from correlation processors, and then averages the weighted and added correlation signals because element 508 of Sawahashi et al. is only a level adjuster.

Examiner's response --- As shown in Fig. 5 of Sawahashi, the matched filters 505A-505C output three correlation signals to the multipliers 506A-506C. The multipliers 506A-506C multiply each of the correlations signals by a respective weight to generate three weighted correlation signals. The weighted correlation signals are summed by the adder to produce the weighted and added correlation signals. The weighted and added correlation signals are then averaged (by dividing by M = three) in the level adjusted 508. Note that Fig. 5 specifies the value of M to be three, which corresponds to the number of the antennas 501 (or the number of the matched filters 505 or the number of the multipliers 506). The outputs of the level adjuster 508 are therefore clearly weighted, added and averaged correlation signals. When incorporating the level adjuster 508 into the embodiment of Fig. 9 of Sawahashi, the outputs of the level adjuster are the weighted, added and averaged correlation signals as claimed.

Allowable Subject Matter

5.   Claims 2-6, 8 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

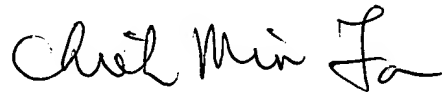policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Chieh M Fan whose telephone number is (571) 272-

3042. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM,

Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number

for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Chieh M Fan
Primary Examiner
Art Unit 2634

January 4, 2005